

Using A pH Meter

(Electrical Conductivity Less than 200 mS/cm)

Field Guide

Task

To use a pH meter to measure the pH of your fresh water sample with electrical conductivity values less than 200 mS/cm

What You Need

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| <input type="checkbox"/> Hydrology Investigation Data Sheet | <input type="checkbox"/> Standard solution for electrical conductivity tester |
| <input type="checkbox"/> Electrical Conductivity Protocol Field Guide | <input type="checkbox"/> Distilled water in wash bottle |
| <input type="checkbox"/> pH meter | <input type="checkbox"/> Clean paper towel or soft tissue |
| <input type="checkbox"/> Electrical conductivity tester | <input type="checkbox"/> Latex gloves |
| <input type="checkbox"/> Two 100-mL beaker | <input type="checkbox"/> Salt crystals* or table salt |
| <input type="checkbox"/> 25 mL of pH 7.0 buffer solution in a jar with a lid - this jar should be labeled "pH 7.0" | <input type="checkbox"/> Tweezers |
| <input type="checkbox"/> 25 mL of pH 4.0 buffer solution in a jar with a lid - this jar should be labeled "pH 4.0" | <input type="checkbox"/> Stirring rod or spoon |
| <input type="checkbox"/> 25 mL of pH 10.0 buffer solution in a jar with a lid - this jar should be labeled "pH 10.0" | <input type="checkbox"/> Thermometer |
| | <input type="checkbox"/> Pen or pencil |

Note: Each jar should have an opening large enough to immerse the pH meter

In the Field

1. Fill in the top part of your *Hydrology Investigation Data Sheet*. In the pH section of the sheet, check the box next to 'pH meter'.
2. Put on latex gloves.
3. Rinse tweezers in sample water and dry with paper towel.
4. Rinse two beakers or cups with sample water three times.
5. Fill one beaker or cup with about 100 mL of sample water
6. Using the tweezers, place one crystal of salt in the sample water. (If you do not have salt crystals, fill this letter O with table salt and pour that into the sample water).
7. Stir thoroughly with stirring rod or spoon.

* A note regarding salt crystals. Crystal of about 0.5 – 2.0 mm in diameter are much easier to work with than the very finely ground "table salt" used in some countries. In North America, the larger salt crystals are often marketed as "sea salt".

8. Measure the electrical conductivity of the treated sample water using the *Electrical Conductivity Protocol*.
 - a. If the electrical conductivity is at least 200 mS/cm, record value on *Data Sheet*. Go to step 9.
 - b. If the electrical conductivity is still less than 200 mS/cm, go to step 6 and repeat until you get a value that is at least 200 mS/cm.
9. Remove the cap from the meter that covers the electrode (the glass bulb on the pH meter).
10. Rinse the electrode on the meter and the area around it with distilled water from the rinse bottle. Blot the meter dry with a clean paper towel. **Note:** Do not rub the electrode or touch it with your fingers.
11. Rinse the electrode with distilled water and blot dry again.
12. Calibrate the pH meter according to the manufacturer's directions.
13. Put the electrode part of the pH meter into the treated sample water.
14. Stir once with meter. Do not let the meter touch the bottom or sides of the beaker. Wait for one minute. If the pH meter is still changing numbers, wait another minute.
15. Record the pH value on the *Data Sheet* under *Observer 1*.
16. Repeat steps 3-14 using new water samples. You do NOT need to calibrate the pH meter again. Record conductivity and pH values on *Data Sheet* as *Observer 2* and *Observer 3*.
17. Rinse the electrode with distilled water and blot dry. Turn off the meter. Put on the cap to protect the electrode.
18. Calculate the average of the three observations.
19. Check to see if each of the three observations is within 0.2 of the average. If all three are within 0.2, record the average on the *Data Sheet*. If all three observations are not within 0.2, repeat the measurements. Calculate a new average. Check to see if all three observations are within 0.2. If they are, record the average. If they are not, talk to your teacher about possible problems.